COMMENT

Two of the author's patients received only one injection of the drug. This was insufficient, as organisms again appeared at the end of three weeks. In the 10-year-old child one dose of 0.3 gm. was given and in the 7-year-old 0.2 gm. was given. No opportunity was permitted for further treatment, as the parents refused to bring the children back to the hospital.

Three of the patients received from two to four injections and at one interval of three weeks organisms were again found in two children, following which the only large dose was given. These three children have since gained markedly in weight and have been continuously well. On June 3, 1916, at the last observation, the children were still free of organisms, six weeks following the last dose of the drug. All these patients had had quinin for eight months before entering the hospital. No quinin was given thereafter. The spleens have never reached normal size, but have become from one half to two thirds smaller. Because of the still definitely enlarged spleens, we do not feel that the patients can be said to be permanently cured.

Only one preparation of arsenic, diarsenol, was used, as at the time we were unable to obtain salvarsan. The dosage was probably too small, but we hesitated to employ larger doses because of the possibility of toxicity from their use. However, no reactions occurred nor any manifestation which would contraindicate the employment of such a remedy. Whether our patients would have done better on salvarsan or neosalvarsan is impossible to say.

From such a limited number of cases and a short period of observation, one cannot draw any conclusions as to the permanent curability of chronic malaria with diarsenol. Against its use in children with malaria is the somewhat greater immediate cost, the technical difficulties of administration, the fear of untoward effects, the apparent necessity for repeated doses, and in our cases, the persistence of an enlarged spleen in spite of such doses as we used. In its favor are the rapid cessation of general symptoms, the sterilization of the peripheral blood, the marked gain in weight and in health. There is a necessity for a remedy which is a parasiticide for strains of malarial organisms that are quinin fast or are not accessible to quinin. What might be accomplished with larger doses over a longer period of time, using quinin as an adjuvant, would be of interest in these cases.

The Health of Workingmen.—The United States Bureau of Mines, which heretofore has been mainly interested in the reduction of deaths by accidents among men connected with the mine industries, has broadened its scope to include the health of the men and has issued a report on health conservation at steel mills. This report contains advice of direct value to every laborer and employer of labor in the United States. The efficiency of the workmen is a subject which no operator can afford to ignore. The prevention of conditions productive of ill health is a plain business proposition. The workingman has a right to demand that he be not required to work beside men who are physically or mentally diseased. Medical supervision is necessary in order to prevent the introduction and spread of infectious or contagious diseases. Such supervision will also show defects of which employees are unaware. Large corporations should employ a full-time physician who should devote his entire attention to the study of efficiency problems. By care along these lines the average loss of time due to illness among 30,000,000 workers in the United States, estimated at nine days a year, or a loss of nearly $880,000,000, may be materially decreased.

BRONCHIECTASIS OF THE UPPER LOBES

WITH REPORT OF FIVE CASES WITH NECROPSIES *

THOMAS McCRAE, M.D.
Professor of Medicine, Jefferson Medical College
AND
ELMER H. FUNK, M.D.
Associate in Medicine, Jefferson Medical College
PHILADELPHIA

From etiology to treatment, the various problems which arise in connection with bronchiectasis are often a cause of difficulty. There are numerous theories as to its etiology, while as concerns the diagnosis, the figures of occurrence suggest that it is recognized twenty times more frequently by the pathologist than by the clinician. The difficulties of diagnosis are increased by the frequent association of bronchiectasis with conditions which may obscure, modify or conceal its features. But notwithstanding this, we should recognize bronchiectasis more often than we do.

SITE OF BRONCHIECTASIS

The older writers believed that the apex was the commonest site, but many modern authorities consider this erroneous and due to an imperfect differentiation of tuberculous and bronchiectatic lesions. Lebert, in a series of fifty-two cases, found unilateral upper lobe involvement in only 11 per cent. King found among the nontuberculous bronchiectases 33 per cent. unilateral and 67 per cent. bilateral, and among the tuberculous bronchiectases 46 per cent. unilateral and 54 per cent. bilateral. These figures indicate that while the tendency is to a bilateral involvement, the tuberculous cases show a greater number of unilateral cases. He found also that unilateral lesions were much more frequent on the right side than on the left. Of our unilateral cases, one was on the right and the other on the left side. King found that for all types of bronchiectasis, tuberculous and nontuberculous, unilateral and bilateral, there is a marked preponderance of cases involving all the lobes of one lung except in tuberculous unilateral cases, in which he found no example of whole lung involvement. This is interesting in connection with our Case 3, in which unilateral involvement of the entire left lung was noted. When a single lobe was involved it occurred in the upper lobe only in a small percentage of cases of pure bronchiectasis, and in a somewhat greater percentage in the tuberculous cases. In other words, according to King, lower lobe involvement predominates strikingly in all types of cases, though to a less marked degree in tuberculous bronchiectasis. This is controverted by the necropsy figures of the Phipps Institute, Philadelphia, in which upper lobe involvement predominates in tuberculous cases. Our experience leads us to believe that while lower lobe involvement predominates in nontuberculous bronchiectasis, nevertheless, in tuberculous cases, upper lobe involvement is not infrequent.

The five cases here reported are unusual in the distribution of the bronchiectasis. They came to necropsy within a period of five months, and represent the only instances of bronchiectasis in eighty consecutive necropsies from the service of the Department for Diseases of the Chest of the Jefferson Medical College.

* Read before the Section on Practice of Medicine at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

Bronchiectasis involving the upper lobes alone is not common, and only slight reference to it is found in literature. These cases illustrate particularly some of the problems of diagnosis.

REPORT OF CASES

CASE 1.—*Extensive bronchiectasis with fibrosis limited to and involving the right upper lobe. Confusion with pulmonary tuberculosis. Differentiation. Death due to lobar pneumonia.*

H. D., No. E 4437, man, white, machinist, aged 62, was admitted March 30, 1915, and died Dec. 10, 1915. His past history was negative. There was no history of syphilis. During the last ten years he had suffered with a "winter cough."

Present Illness.—This dated to one year before, when he had a severe attack of bronchitis, which occurred in the middle of winter and gradually subsided in the summer, to recur during the winter prior to his coming under our observation. Shortly after the onset he brought up 2 ounces of blood during a paroxysm of coughing. The cough on admission was moderately severe and productive, during both the day and night, of a moderate amount of thick yellowish sputum. He never had any pain in the chest, but dyspnea occurred quite constantly on exertion. He had no chilliness, fever or night sweats. His best weight was 220 pounds at the time of onset, and the present weight 174 pounds. Coincident with the loss of weight there had been a gradual diminution in strength.

Physical Examination.—He was fairly well nourished. The chest showed some flattening of the upper right half anteriorly with slight drooping of the shoulder. The superficial veins over the right upper chest and anterior surface of the right shoulder to the middle third of the arm were dilated and tortuous. Expansion on the right side was distinctly limited. The percussion note was dull anteriorly on the right side from the apex to the third rib and posteriorly to the fourth vertebral spine. The breath sounds were generally harsh except over the area of dulness where, although their intensity was diminished, there was a distinct tubular quality. Vocal fremitus and resonance were increased, and sibilant and crackling râles were heard over the same area. There was distinct clubbing of the fingers and, to a less extent, of the toes.

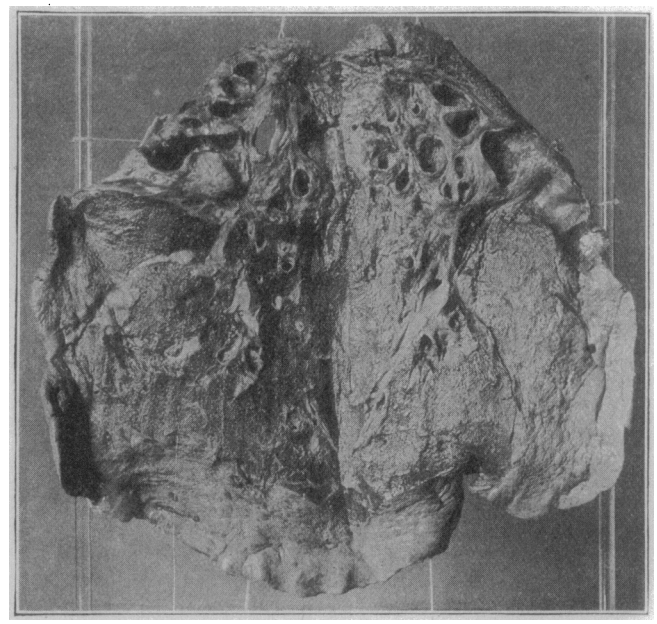

Fig. 1 (Case 1).—Right lung cut open. The sharp line of demarcation between the bronchiectatic upper lobe and the normal lung tissue of the lower lobe is the interlobar fissure. The upper lobe has been converted into a series of cavities as a result of multiple saccular dilatations of the bronchial tubes. Between the dilated bronchi the lung tissue is largely replaced by densely firm fibrous tissue. Very little air-containing pulmonary structure remains. No gross evidence of pulmonary tuberculosis could be found. The lower portions of the lung show passive congestion and slight edema. The opposite lung shows the lobar pneumonia from which the patient died.

The blood showed: hemoglobin, 87 per cent.; red cells, 4,700,000, and leukocytes, 14,000. The differential counts gave polynuclears from 55 to 60 per cent. and mononuclears 32 to 40 per cent. The Wassermann test was negative. The urine showed nothing of note, and the functional test gave 58 per cent. of phenolsulphonephthalein excretion in two hours. Repeated sputum examinations did not show tubercle bacilli. The Roentgen-ray report (Dr. Manges) was: "The right upper lobe shows a dense fibrous mass with possibly a cavity or a small amount of lung tissue left."

Progress.—Immediately after admission to the hospital the patient began to improve. The cough became less severe, expectoration lessened, his weight increased (12 pounds in two months) and his strength returned so that he was able to be up during the entire day. He had no elevation of temperature, except for occasional rises to 99 and 100. He was discharged on request and admitted to a sanatorium during the following summer months, where the diagnosis of *advanced tuberculosis* was made. He was readmitted under our care in the autumn considerably improved, afebrile, but still suffering from a distressing cough and considerable expectoration. The physical examination was identical with that of previous admission. It was our opinion that he suffered with a localized nontuberculous fibrosis of the right upper lobe with perhaps some bronchial dilatation giving rise to signs of cavity. The opposite lung was clear. He was feeling particularly well when an attack of lobar pneumonia with involvement of the left lung supervened from which he died in three days.

Remarks.—The principal reasons for excluding tuberculosis were the apparent freedom from involvement of the left lung in the presence of so well marked a lesion in the right upper lobe and the absence of tubercle bacilli in the sputum. He had been in three sanatoriums; in each the diagnosis of advanced tuberculosis was made. In one sanatorium no examination of the sputum was made.

Necropsy (Dr. Dry. Only the relevant findings are reported in this and subsequent cases).—Lobar pneumonia of left lung. The right pleura was thickened and densely adherent over the upper lobe only. The upper right lobe showed marked fibrous change and cavities throughout due to multiple saccular dilatation of the bronchi. No evidence of tuberculosis.

CASE 2.—*Bronchiectasis involving the upper portions of both lungs, associated with a chronic ulcerative tuberculosis of the same area with small cavities. The bronchiectatic dilatations were in excess of the tuberculous cavities. The impossibility of diagnosing bronchiectasis under these conditions.*

L. S., No. D 5237, man, white, pedler, aged 58, was admitted May 27, 1914, and died Jan. 24, 1916. The past history was negative. He denied having had syphilis.

Present Illness.—Ten years ago he applied to a local hospital for treatment for "bronchial trouble" characterized by a constant annoying cough with expectoration which at times was blood streaked. Since then he had never been entirely free from cough except for very short intervals, usually in the summer months. He had been a patient in various hospitals and sanatoriums with the diagnosis of tuberculosis. At the time of admission to our care his cough was moderately severe and productive, especially at night, of a large amount of yellowish sputum. Blood spitting occurred on numerous occasions, never amounting to more than streaked sputum and rarely lasting more than a day or two. Hoarseness was present at various times. The appetite had been fair, but digestion poor. His best weight was 124 pounds at the time of onset ten years ago, his lowest weight 99 pounds six months ago, and present weight 104 pounds. He had generally lost strength, although feeling better at times; on admission he was quite weak.

Physical Examination.—He was poorly nourished and pale. The thorax was somewhat rounded and emaciated. The right side was smaller than the left and flattened anteriorly over the upper half. The percussion note was hyperresonant over the entire chest anteriorly except below the right clavicle to the

second rib; posteriorly resonance was impaired from the apexes to the spine of the scapulae on both sides and over the right base from the angle of the scapula downward. The breath sounds were generally tubular throughout except below the fourth rib anteriorly, where they were bronchovesicular, and posteriorly below the angles of the scapulae, where they were distant, especially on the right side and corresponding to the area of dulness. The breath sounds on the left side in the upper half were of a typical amphoric quality. Abundant râles of all types were heard throughout the entire pulmonary area, with greatest predominance in the upper lobes, especially on the right side. Vocal fremitus and resonance were quite distinct over the upper chest, especially in the right side and diminished at the right base. The extremities did not show clubbing.

The blood showed: hemoglobin, 70 per cent.; red cells, 4,400,000; leukocytes, 11,000 to 18,000. The polynuclear count varied from 64 to 76 per cent., and the mononuclears from 24 to 36 per cent. Wassermann test was negative. The urine had a low specific gravity with albumin and hyaline casts. Phenolsulphonephthalein output varied from 29 to 40 per cent. in two hours. The sputum contained large numbers of tubercle bacilli.

Temperature Record.—Except for a few months, he was under constant observation from May, 1914, to January, 1916, when he died. For the greater part of this time he was afebrile, except for an occasional week when he would have a slight afternoon rise in temperature for several hours, not exceeding 99 to 100, and, still more rarely, an acute "flare up" to 101 or 102 for several afternoons. The third hour temperature during the last month of life was rarely above normal, and during the last two weeks was subnormal with diurnal oscillations of 2 and 3 degrees. The bedside chart stood in marked contrast with those of fellow patients manifesting the irregular fever so frequently found in advanced tuberculosis.

Progress. — The clinical course was one of progressive weakness until the final month of life, when he was generally confined to bed. The cough was at all times distressing and productive. Blood streaked sputum was frequent and transient in duration. His death, though not unexpected, occurred rather suddenly.

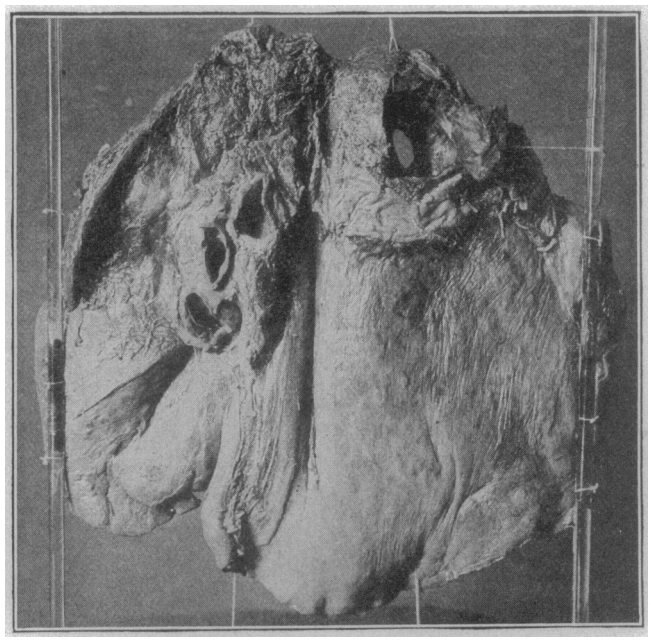

Fig. 2 (Case 1).—External view of same lung as in Figure 1. In the upper portion is seen a trap door of tissue cut in the posterior wall of the largest saccular dilatation exposing to view the interior and the distal wall with the opening of the bronchus therein. The pleura over the upper lobe is thickened and was densely adherent, causing some laceration of the lung tissue during removal. The pleura over the lower lobe is smooth, glistening and apparently normal.

Necropsy (Dr. Dry).—Marked thickened adherent pleura on both sides. Cavities throughout the upper portions of both lungs with marked fibroid changes. The bronchiectatic were in excess of the tuberculous cavities.

CASE 3.—*Extensive bronchiectasis and tuberculosis limited to the left lung. A large cavity in the upper lobe with saccular bronchiectasis of the upper and lower lobes. The question at necropsy as to whether the large apical cavity was tuberculous or bronchiectatic decided only after a careful study by the pathologist. Diagnosis of bronchiectasis suspected during life.*

V. D., No. D 2425, woman, white, mill-worker, aged 20, admitted Nov. 6, 1913, died Feb. 29, 1916. There was a family history of tuberculosis. The previous history was negative.

Present Illness.—The onset was about two years ago with cough and weakness. She was sent to a state sanatorium where she remained for six weeks. She kept house until one year ago when she returned to work in a mill, where she continued until one month ago, when she stopped because of cough and hemorrhages from the lung. The cough of late had become more and more severe and productive of considerable yellowish white sputum which was often blood streaked. The first hemorrhage amounted to a "basinful." She had no pain, but there was dyspnea on exertion. Chilliness and fever were frequent, and night sweats occurred every now and then. Her best weight was 107 pounds three months ago, weight at present 72 pounds.

Physical Examination.—An ill nourished, emaciated, pallid young adult woman. She had moderate dyspnea with slightly cyanotic lips. The chest was flat and emaciated with accentuation of the bony prominences and depressions. The respirations were rapid and shallow with general limitation, especially of the left side. Bronchial fremitus was distinctly felt over the entire left lung. Percussion revealed a slight quality of tympany on the right side anteriorly and posteriorly to the fourth thoracic spine, below which the note was impaired; on the left side dulness extended from the apex to the fourth rib anteriorly, and there was impaired resonance over the entire surface posteriorly, except from the second to the fourth rib, where it approached tympany. Breath sounds were loud and tubular over the entire pulmonary area, especially on the left side, where from the clavicle to the third rib anteriorly and between the second and fourth spine posteriorly, they were distinctly amphoric. Scattered râles of all types were found throughout the lung, especially on the left side. The extremities did not show clubbing.

The blood showed: hemoglobin, 65 to 70 per cent.; red cells, 5,400,000 to 4,300,000; leukocytes, 14,000 to 18,600. The polynuclears varied from 66 to 80 per cent. and mononuclears 18 to 28 per cent. The Wassermann test was negative. The urine was clear. The sputum contained tubercle bacilli.

Progress.—After staying in the hospital under observation for eight months the patient felt slightly better and was transferred to a sanatorium in the country. The cough, expectoration and fever remained unchanged. Hemoptysis was frequent, usually in the form of blood-streaked sputum, but on several occasions it was so profuse as to be alarming. The third hour temperature record showed constant afternoon elevations to from 101 to 103 with rapid pulse. After the lapse of one year she returned in about the same condition, but physical examination showed that the left lung was more extensively involved and the right lung considerably improved. We could not account for these changes in the physical signs, except that possibly many of the previous findings in the right lung were due to an associated nontuberculous process which had cleared. We were at a loss to explain the signs of extensive involvement with cavity formation on the left side and so little involvement on the right side. In the ward classes it was pointed out that "perhaps an associated unilateral bronchiectasis" was present. The patient became weaker and had arthritis of the left knee in the last three months of life. The hemoptyses, so frequent on the first admission, were entirely absent. The temperature showed marked diurnal oscillations. Death resulted from lobar pneumonia of the right lung on the second day of its course.

Necropsy (Dr. Dry).—Lobar pneumonia of the right lung, which showed no signs of tuberculosis. The pleura was thick-

ened and adherent over the whole of the left side. The upper lobe of the left lung showed a large cavity with a fibrous wall at the apex and numerous smaller cavities due to bronchiectasis. At necropsy it was not possible to say whether the large cavity was tuberculous or bronchiectatic. The subsequent studies in the pathologic department by Dr. Coplin established its tuberculous nature. Throughout the remainder of the upper lobe and through the lower lobe there was a diffuse, saccular and cylindric bronchiectasis. The lung showed no gross evidence of tuberculosis, although microscopic sections from numerous areas revealed chronic caseous tuberculous bronchitis, fibrocaseous peribronchitis, caseous pneumonia, incomplete atelectasis, and fibrosis. Many of the bronchi showed a deficiency or absence of cartilaginous tissue suggesting faulty bronchogenesis.

CASE 4.—*Well marked acute tuberculosis of recent onset involving both lungs. No signs of cavity formation, yet necropsy revealed a bilateral bronchiectasis of limited extent in both upper lobes.*

E. D., No. F 2055, man, white, farmer, aged 27, was admitted Oct. 21, 1915, and died March 10, 1916. An abscess of the neck (tuberculous glands?) had been opened two years before. There was no history of syphilis.

Present Illness.—The onset was two months before with pain in the throat, hoarseness and cough. These increased in severity; the cough was productive of a considerable quantity of blood streaked sputum. He had lost 42 pounds in weight. On admission he complained of chilliness, fever and night sweats.

Physical Examination.—He was pale and emaciated. The larynx was red, and cords swollen and extensively ulcerated (tuberculous). The chest was flat and emaciated with limited expansion. The percussion note was generally clear, except above the right clavicle and over the same apex posteriorly, where it was distinctly impaired. The breath sounds were generally harsh with prolonged expiration, most marked in the upper part of the lungs. Distinct cogwheel breathing was audible over the left base posteriorly. Scattered crackling râles were heard over the upper halves of both lungs. The extremities showed beginning clubbing of the fingers and toes.

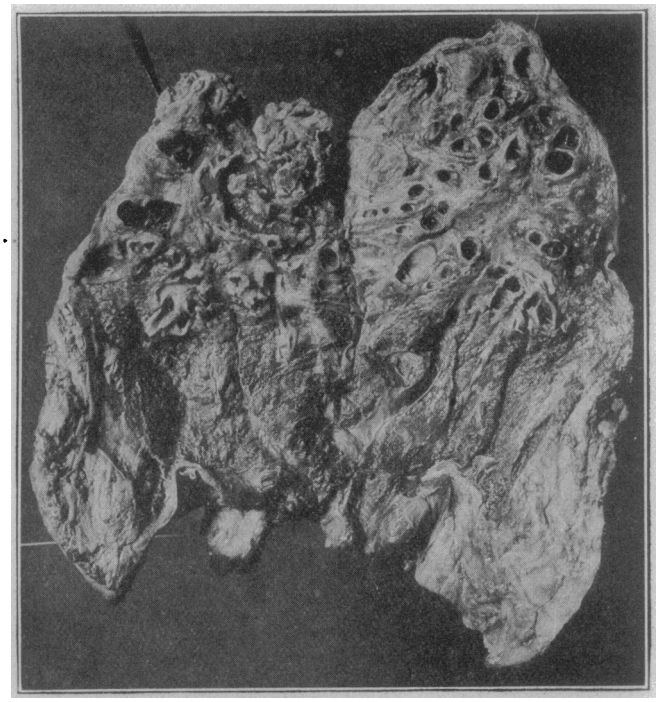

Fig. 3 (Case 2).—Right lung. The upper half of lung shows advanced bronchiectasis. The dilatations are for the most part saccular, although cylindric in some areas, as illustrated on the left side, where the bronchus has been split in its long axis. The bronchial walls are not only dilated, but at points markedly thickened. The lesion corresponds probably to the type described as dilatation with thickening in contradistinction to dilatation with thinning. The intervening tissue is dense and firm, and here and there can be found small fibrocaseous areas, not only throughout the bronchiectatic area, but also in the lower lobes. A small tuberculous cavity can be seen in upper right of specimen at apex. The pleura overlying the upper half of the lung was densely adherent and irregularly thickened.

The blood showed: hemoglobin, 67 per cent.; red cells, 4,700,000, and leukocytes 16,000. The polynuclears were 88 per cent. and mononuclears 12 per cent. The Wassermann test was negative. The urine showed albumin and hyaline casts. The sputum did not contain tubercle bacilli.

Progress.—From the time of admission the course was progressively downward with weakness, irregular fever, night sweats, pain in the throat, hoarseness, shortness of breath and difficulty in swallowing. He died as the result of progressive asthenia.

Necropsy (Dr. Dry).—There was marked pleural thickening over the apexes of both lungs, more marked behind. Both upper lobes showed fibrosis and many dilated bronchi. Throughout both lungs there were many miliary tubercles. There was a tuberculous cavity at the left apex.

CASE 5.—*Bilateral apical bronchiectasis associated with bilateral ulcerative tuberculosis. Adhesive pleuritis with fibrosis of the lungs. The recognition of both conditions during life.*

M. B., No. F 2060, man, white, aged 30 years, was admitted Oct. 29, 1915, and died May 17, 1916. One brother, at present in good health, was treated for tuberculosis some years ago. The past history was negative.

Present Illness.—The onset occurred two years ago with an attack of pleurisy, since which time he has had a moderately severe cough with expectoration of moderate amounts of mucopurulent sputum, at times blood streaked. He is frequently dyspneic, especially on exertion. He has been losing strength gradually, until at present he is unable to work. His best weight was 120 pounds five years ago, and his present weight is 104.

Physical Examination.—The chest was markedly emaciated and showed a deep depression of the lower sternum and right half. The expansion was generally limited, especially on the right side. The percussion note approached tympany above and below both clavicles. The breath sounds were generally harsh with prolongation of expiration and at both apexes anteriorly and posteriorly distinctly cavernous in character. There were numerous râles of all types over the entire chest, especially at the apexes. The extremities did not show clubbing.

The blood showed: hemoglobin, 74 per cent.; red cells, 4,510,000, and leukocytes, 13,600; lymphocytes, 22 per cent.; polynuclears, 76 per cent.; eosinophils, 2 per cent. The urine showed a trace of albumin with a few hyaline and granular casts. The sputum was positive for tubercle bacilli. The Wassermann test was negative.

The Roentgen ray (Dr. Borzell) showed extensive bronchiectasis involving both upper lobes with marked fibrosis. On the right side as far down as the seventh rib the pleura was very much thickened; considerable infiltration of the right lower lobe.

Progress.—For six months the condition remained unchanged. He was discharged on request and readmitted May 4, suffering from a profuse hemoptysis. The hemorrhage gradually ceased, but he became progressively weaker, and died, May 17. The diagnosis of chronic pulmonary tuberculosis with bilateral cavity formation with associated bronchiectasis was made both by the clinician and the roentgenologist and confirmed by necropsy.

Necropsy (Dr. Dry).—Both pleural cavities were completely obliterated by adhesions, especially dense over the apexes. In removing the lungs, apical adhesions caused tearing of pulmonary tissue. The lungs showed extensive fibrosis in the upper lobes with numerous small cavities, which mostly were saccular bronchiectases; in each upper lobe there was a distinct tuberculous cavity about 3 cm. in diameter.

BRONCHIECTASIS IN RELATION TO SYPHILIS AND TUBERCULOSIS

Syphilis was long considered an important factor in the "pneumopathies" until Laennec showed the unity of the anatomic lesions of tuberculosis. There-

after tuberculosis assumed the greater importance. Recently Tripier and other French writers have argued on anatomic and clinical grounds that syphilis is the cause of the majority of cases of bronchial dilatation. They exclude those cases due to foreign bodies or stenosis and the group with cylindric dilatation generalized in one or both lungs which is observed in infants and more rarely in young subjects under the influence of repeated attacks of coughing and following various lesions causing compensatory dilatation. Abecassis[1] reported thirteen instances of bronchial dilatation associated with other syphilitic lesions such as aortitis, aneurysm, tabes, etc. Garin and Laurent[2] found the Wassermann reaction positive in five cases which they studied. In our five cases the histories were entirely negative, no evidences of syphilis were present, and the Wassermann tests were negative. We have not been able to find in the literature any reference to the finding of the *Spirochaeta pallida* in this type of pulmonary lesion. While syphilis is a possible factor in some cases, most students of the disease are of the opinion that it is not the important factor which the French writers emphasize.

With regard to the relation of tuberculosis to bronchiectasis, we have the extreme views of Rokitansky, who considered the two diseases almost incompatible, and Trojanowsky and King, who found tuberculosis in twenty-one out of sixty-eight, and in twenty-five out of seventy cases, respectively. In our five cases, tuberculous lesions were associated in four instances. King[3] classified seventy cases of bronchiectasis occurring at the Brompton Hospital as follows: (1) "pure bronchiectasis," those associated with tuberculosis, thirty-six cases; (2) "traumatic bronchiectasis," those resulting from aneurysm, tumor, foreign bodies, syphilitic stricture, nine cases; (3) "tubercular bronchiectasis," those associated with tuberculosis, twenty-five cases. Expressed in percentage, nontuberculous bronchiectasis occurred in 66 per cent. and tuberculous bronchiectasis in 34 per cent. of the seventy cases. With regard to the "tuberculous bronchiectasis," King is of the opinion that all of these cases were primarily tuberculous.

Moderate degrees of bronchial dilatation are not infrequently found associated with pulmonary tuberculosis at necropsy; but clinically the association can be demonstrated only rarely, even when fairly well marked. A probable explanation is found in the fact that when bronchiectatic lesions exist with tuberculosis, they are most frequently found in the upper lobes, and are confused with signs due to tuberculous excavation. A comparison of the clinical and pathologic reports of the Phipps Institute, Philadelphia, is interesting in this connection. Among 3,551 patients with tuberculosis, only 5 were complicated with bronchiectasis; among 320 necropsies, bronchial dilatation was frequently found and distributed throughout the lungs as follows: left upper lobe, 40; right upper lobe, 48; right middle lobe, 31; left lower lobe, 28; right lower lobe, 24. The etiologic relationship of the two lesions is emphasized by the relatively greater frequency of involvement of those portions of the lungs where tuberculosis usually has its initial and most extensive lesion.

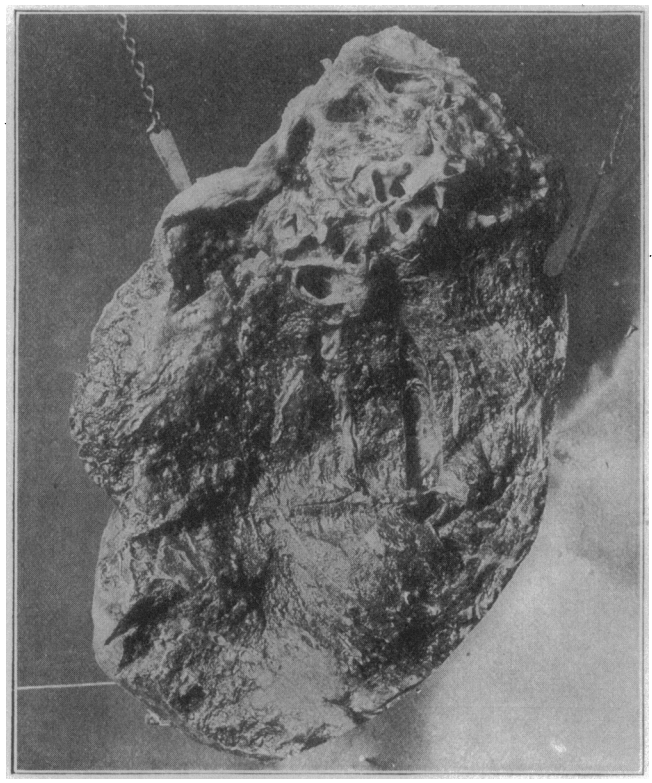

Fig. 4 (Case 2).—Left lung. The bronchiectasis is of the same character as in the right lung (Fig. 3), though not quite as extensive. Its sharp limitation to the upper portions of the lung is striking. On the right side of specimen where hook is inserted a rather large cavity is seen, the wall of which presents the usual appearance of a tuberculous lesion. In the lower portions of the lung are numerous conglomerate tubercles. The pleura overlying the upper lobes is thickened and at time of necropsy was quite firmly adherent.

In the cases here reported it is important to decide, if possible, whether there is any clue to the etiology. So far as the histories are concerned, in no case did the disease seem to follow any severe infection. Certain causes seem unlikely to be of importance, especially those which affect the whole of the lung structure. Thus the mechanical pressure of secretion, increased air pressure, atrophy of the bronchial wall, alteration of nutrition, paralysis of the fibers, nervous causes, do not seem likely to operate so locally. But certain other causes may have a definite influence. Among those are pneumonia, tuberculosis, extrabronchial traction, most often caused by pleural adhesions to the thoracic wall and fibroid changes in the lung, a local inflammation of the bronchi, and bronchial stenosis (from a foreign body, pressure of aneurysm or tumor, gumma of a bronchus). In general we must agree with Ewart that there must be some elementary factor common to all varieties, and this is obstruction in some form. Traction on the bronchial wall may arise from a peribronchitis or from a chronic adhesive pleurisy which extends inward. In either case if the process extends so that there is a connection between the bronchial and chest wall, dilatation may follow.

Certain of these possibilities seem to be definitely excluded in all and others in some of our cases. A foreign body, aneurysm or tumor, gumma or syphilis in any form are ruled out. The possibility of pneumonia is difficult to exclude in any case merely from the history, but changes resulting from pneumonia are more important than the pneumonia itself. Tubercu-

1. Abecassis: Lyon thesis, 1910.
2. Garin and Laurent: Jour. physiol. et path. gén., 1910, xii, 553.
3. King: Scot. Med. and Surg. Jour., 1904, xiv, 42, 481.

losis was present in four of our cases. However, what seems most important in this series was the condition of the pleura. In all but one the adhesions were limited to the lobe or lobes with bronchiectasis. This must be regarded as an important etiologic factor. However, it should be said that some regard the fibrosis and pleurisy as secondary phenomena to the bronchiectasis. In any event the frequent association of bronchiectasis and fibrosis is agreed on, and as fibrosis is recognized more frequently, its presence should always suggest careful study of the possibility of bronchiectasis.

CLINICAL FEATURES AND DIAGNOSIS

The features of the marked general cases are usually such that a diagnosis should be made readily enough. The problem is a more difficult one in cases of local bronchiectasis. The history may be of help, especially in any detail which suggests the possibilities of a foreign body having gained entrance to a bronchus, but of particular importance is a history of a chronic cough for a long period with considerable expectoration *without marked constitutional disturbances*, especially if the sputum is fetid. The cough being paroxysmal and often induced by change in position is also suggestive. Too much stress should not be placed on the odor of the sputum; in four of our cases there was no marked fetor of the sputum. This may be due to the fact that in apical bronchiectasis there is better drainage and consequently not the degree of retention common in basal bronchiectasis. The presence of blood in the sputum is not diagnostic, as it occurs with the same frequency in tuberculosis. It was present in all our cases. The sputum in a marked case is usually characteristic in amount and character, but in our cases it was not distinctive except at times in Case 1. Dyspnea is common, especially on exertion, and is most marked in cases with considerable fibrosis.

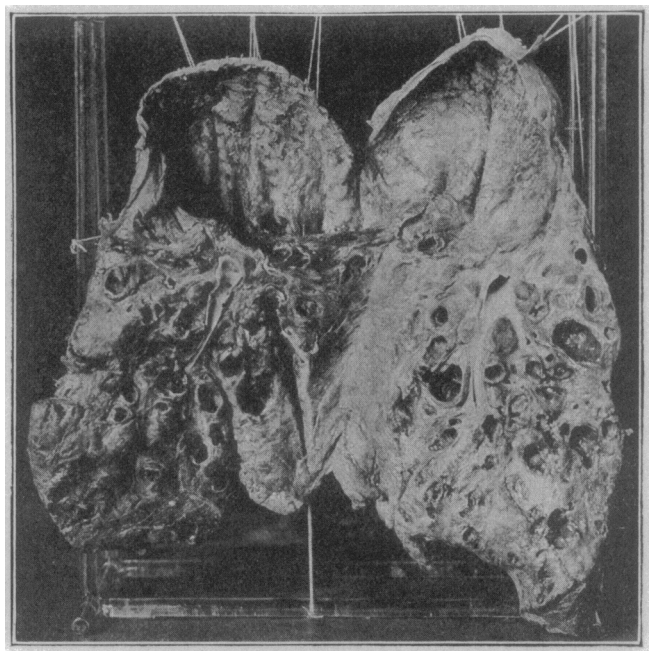

Fig. 5 (Case 3).—Left lung. The apex of the upper lobe is converted into a single cavity with a thin, densely firm fibroid wall composed largely of thickened pleura. Microscopic sections of the wall are largely fibrous tissue. The lower portion of the upper lobe and all of the lower lobe are transformed into a series of cavities which intercommunicate in a remarkable fashion. These cavities are bronchial dilatations. The opposite lung showed a lesion of lobar pneumonia at necropsy, and was free from tuberculosis. A discussion as to the character of the large cavity, whether tuberculous or bronchiectatic, or both, is contained in the text.

The problem of diagnosis of these upper lobe cases of bronchiectasis is largely that of differentiation from tuberculosis. When the two exist together, a diagnosis of bronchiectasis is practically impossible and, if made, an exact diagnosis as to how much of the change is due to this condition and how much to tuberculosis is still more difficult. The nontuberculous cases are often regarded as tuberculosis, an error which can be made only through carelessness. The sputum of a patient with advanced pulmonary lesions due to tuberculosis always contains tubercle bacilli. If this was recognized, we would not miss so many cases of chronic nontuberculous lung conditions and call them tuberculous. It would be interesting to know how many such there are in tuberculosis sanatoriums today, with a diagnosis of advanced pulmonary tuberculosis but no tubercle bacilli in the sputum. The first case here reported is an example (the patient was in several sanatoriums with an invariable diagnosis of tuberculosis). It sounds elementary, but evidently requires emphasis to insist that when symptoms and signs point to advanced pulmonary tuberculosis, and repeated sputum examinations do not show tubercle bacilli, the condition is not tuberculosis.

Another point which may aid in diagnosis is the disproportion between the signs in the lungs and the constitutional symptoms (likely to be present if the condition is tuberculosis). This is not invariable, for many tuberculous patients show the same thing; but when present over a long period, it should suggest careful study of the possibility of bronchiectasis. This was a striking point in Case 1.

The belief that in the diagnosis between a tuberculous and a bronchiectatic cavity the apical position of one and the basal position of the other may be considered as almost positive evidence cannot be accepted. We believe that too much importance has been given to this because bronchiectasis with tuberculosis is perhaps more often apical than basal, and because apical nontuberculous bronchiectasis, either unilateral or bilateral, is probably more common than the usual teaching suggests.

Roentgenographic study, particularly by the stereoscopic method, should be practiced in every case with the hope that in the future this diagnostic aid may be developed. At the present time, however, most students of the disease have the opinion that the Roentgen ray is of comparatively little value in the diagnosis of bronchiectasis. In the demonstration of foreign bodies, aneurysm, etc., it has a distinct field of usefulness.

Treatment is largely palliative. The adoption of a semierect or erect posture facilitates drainage in the apical cases. After intratracheal injections the patient should be placed in a recumbent posture. Autogenous vaccines may be tried, although their value is undetermined. The general measures are those usually applied to improve the nutrition of the patient.

SUMMARY

1. In five cases of apical bronchiectasis, the distribution was: right upper lobe, one; right upper and lower lobe, one; both upper lobes, three.

2. Tuberculosis was associated in four cases, three of which were bilateral.

3. Syphilis was apparently excluded as an etiologic factor.

4. Pleural thickening over the site of the bronchiectasis was extreme in all and limited to the area of bronchiectasis in four. This suggests an important etiologic influence.

5. There was marked evidence of pulmonary fibrosis in the bronchiectatic areas.

6. The diagnosis is difficult, but possible more frequently if looked for in the presence of fibrosis or tuberculosis with which it is not uncommonly associated. Advanced apical bronchiectasis unassociated with tuberculosis may be mistaken for tuberculosis, which error can be avoided by careful sputum examination.

7. The absence of fetid sputum in these cases was probably due to the fact that drainage is more thorough in upper lobe cases.

ABSTRACT OF DISCUSSION

DR. FREDERICK T. LORD, Boston: As regards the pathology, bronchiectasis is a striking feature at necropsy and the impressive picture it presents may lead us to consider it of primary importance, but we should think of it, as close examination of the lungs almost invariably shows, as a relatively insignificant part of a more or less extensive bronchopulmonary involvement. Concerning the diagnosis: It is at times very difficult to distinguish between bronchiectasis and chronic abscess, and it must be acknowledged that we cannot always make this differentiation. In the presence of such extensive bronchopulmonary lesions as we have seen illustrated in the photographs shown, this is of less importance than in other clinical cases in which the lesions are of limited extent, as indicated by physical signs and Roentgen examination. In such cases a decision between bronchopulmonary infection leading to bronchiectasis and chronic pulmonary abscess may be the deciding factor between nonoperative and operative treatment. The presence in the sputum of elastic tissue with alveolar arrangement indicates involvement of the lung tissue and a loss of pulmonary substance but does not exclude a complicating bronchiectasis.

When the differential diagnosis cannot be established it seems best in the presence of limited and circumscribed involvement to give the patient the benefit of the doubt and consider operative interference.

POSTURE IN OBSTETRICS *

J. W. MARKOE, M.D.
NEW YORK

Stimulated by a most interesting paper on the "Significance of Posture in Obstetrics" by the late Dr. Albert F. A. King of Washington, I began in 1909 the study of its effect in the different stages of labor. Up to that time I had been in the habit of having my patients grasp the foot of the bed or the back of a firm chair with both hands, and then during the pain squat down so that the knees pressed against the side of the uterus and the entire weight of the contents of the uterus was directed on the dilating cervix. In the more intelligent class of patients this was comparatively easy to accomplish, but in the less intelligent and highly nervous type, they either refused to assume the position or sank down on the floor. It therefore came to me that if I could provide a suitable chair I would gain my point of bringing the weight of the uterine content so that it would exert its force to the best advantage in dilating the cervix and parturient canal.

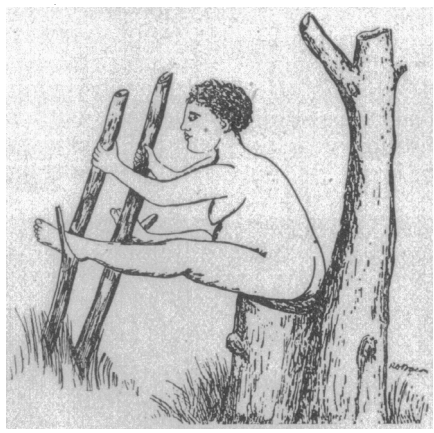

Fig. 1.—Primitive obstetric chair used by native African women. (This and the following eight illustrations are taken from G. T. Witkowsk's "Histoire des accouchements chez tous les peuples," 1887.)

Before beginning the construction of this first chair I looked up the literature on the subject and found it so interesting that I shall give a brief abstract of what I found.

The antiquity of the obstetric chair, according to the opinion of Fugelmann, is that the earliest possible reference to it in our possession dates back to Moschion, a Greek physician of the second century. Comments on the use of the obstetric chair are scattered through the writings of several Greek physicians, such as Aetamidoe, Aëtius, Toranus of Ephesus, and Paulus of Aegina. The latter states that the time has come for the mother to be placed on the chair when palpation has shown the uterus to be open and when the infant is about to be born.

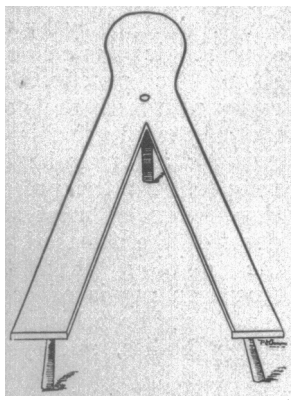

Fig. 2.—Chair after model of Savonarole, 1747.

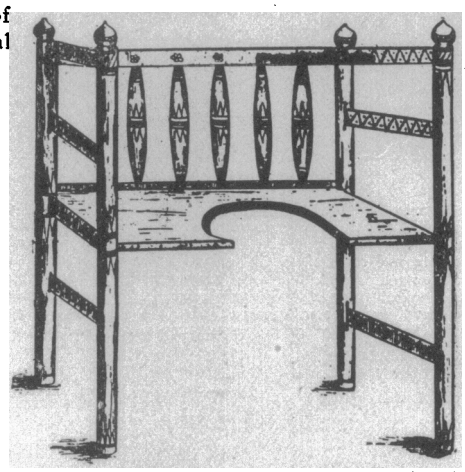

Fig. 3.—Obstetric chair used in Oriental countries.

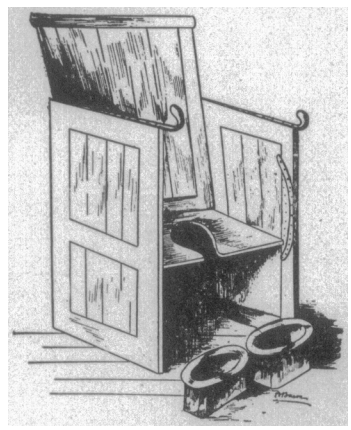

Fig. 4.—Obstetric chair of Deventer, 1800.

Until its reappearance in the middle ages, there is a gap in the history of the obstetric chair, which is again

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.